

REMARKS/ARGUMENTS

Claims 1-36 are pending in the application. Claims 33 and 35 have been allowed. Claims 1-3, 11-14, 22-25, and 36 stand rejected under §102. Claims 7-10, 18-21, and 29-32 stand rejected under §112, but are considered allowable over the prior art should the §112 rejection be cured. Claims 4-6, 15-17, 26-28, and 34 have been deemed allowable but are objected to as depending from a rejected base claim. In view of the following remarks, the applicants respectfully ask for the Examiner's thoughtful reconsideration.

CLAIM REJECTIONS – 35 USC §112

Claims 7-10, 18-21, and 29-32 stand rejected under §112. In particular, the examiner noted the lack of antecedent basis for the use of the phrase “the dot placement indicator” in Claims 7, 18, and 29. Claims 7, 18, and 29 have been amended to address the Examiner's concerns.

CLAIM REJECTIONS – 35 USC §102

Claims 1-3, 11-14, and 22-25 stand rejected as being anticipated by USPN 7,031,025 issued to He. It is initially noted that the two inventors, Zhen He and Charles A. Bouman, of the present application are also inventors of the '025 patent. However, the '025 patent lists a third inventor. Because of the third inventor and because the '035 patent was not published until after the filing of the present application, the '025 patent can qualify as prior art only under §102(e).

Claim 1 is directed to a method for generating a halftone from a plurality of pixels and recites the following:

1. modulating dot density according to pixel intensity;
2. controlling dot cluster size according to pixel intensity; and
3. modulating dot size according to pixel intensity.

Addressing Claim 1, the Examiner asserts that the '025 patent discloses “a halftone generation method and apparatus that modulates dot density and dot

size in accordance with obtained density and dot size factors.” Claim 1 does not recite modulating dot size and dot density “in accordance with obtained density and dot size factors.” Claim 1 expressly recites that dot size and density are modulated according to “pixel intensity.” Nonetheless, Claim 1 of the ‘025 patent recites that dot density and dot size are modulated using a “pixel value.” It is presumed that the Examiner is equating the “pixel value” of the ‘025 application with the “pixel intensity” recited in Claim 1 of the present application. One could reasonably interpret Column 6, lines 21-29 of the ‘025 patent to reach a conclusion that “pixel value” and “pixel intensity” are one and the same.

However, the Applicant respectfully contends that the ‘025 application mentions nothing of controlling a dot cluster size based on a pixel value (i.e., pixel intensity). With respect to the act of controlling a dot cluster size, the examiner asserts that the ‘025 patent discloses “a halftone generation method and apparatus that . . . modulates cluster size (by grouping clusters into larger clusters) in order to translate an original pixel intensity into a halftone representation based on original pixel intensity. For support, the Examiner cites column 7, lines 16-28 of the ‘025 patent. That passage is reproduced below:.

As shown in FIG. 5, the dot size modulation is a pulse width modulation (PWM) system 130 that directly modulates the size of the physical dot, as is well known in the art. The dot size modulation step requires very little computation since the appropriate PWM codes for each dot size may be precomputed and stored in a LUT and is accessed using the halftone value from the TDED system 128 and the dot size value from the dot size LUT 124. The dot size modulation, however, may also depend on the particular application, i.e., printing system, and may be any one of a number of known methods which vary the size of a printed dot either by grouping clusters of dots together, including clustered dot digital halftoning.

The passage mentions nothing on controlling a dot cluster size according to pixel value (pixel intensity). Instead, the passage merely mentions that “dot size modulation” may be a method which varies the size of a printed dot “by grouping clusters of dots together, including clustered dot digital halftoning.” The ‘025 application does not disclose controlling the dot cluster size itself – the ‘025

patent only discloses modulating dot size by grouping clusters of dots together. There is not mention of controlling the size of those dot clusters based on any factor let alone on pixel intensity.

Consequently, the '025 patent fails to teach or suggest controlling dot cluster size according to pixel intensity. For at least this reason, Claim 1 is patentable over the cited reference as are Claims 2-10 which depend from Claim 1.

Claim 11 recites a method for generating a halftone from a plurality of pixels and recites, for at least one pixel:

1. obtaining a cluster factor corresponding to the pixel's intensity and calculating a threshold value as a function of a dot screen and the cluster factor;
2. obtaining a dot density factor corresponding to the pixel's intensity and implementing an error diffusion algorithm that is a function of the dot density factor and the threshold value to generate a dot placement indicator; and
3. obtaining a dot size factor corresponding to the intensity value and generating a halftone print code as a function of the dot size factor and the dot placement indicator.

Addressing Claim 11, the Examiner states:

He discloses (column 5, lines 27-53) a halftone generation method and apparatus that modulates dot density and dot size in accordance with obtained density and dot size factors and also (column 7, lines 16-28, particularly lines 25-28) modulates cluster size (by grouping clusters into larger clusters) in order to translate an original pixel intensity into a halftone representation based on original pixel intensity.

It is initially noted that the Examiner fails to assert that the '025 patent teaches each and every limitation of Claim 11. In particular, Claim 11 explicitly recites:

- calculating a threshold value as a function of a dot screen and the cluster factor;
- implementing an error diffusion algorithm that is a function of the dot density factor and the threshold value to generate a dot placement indicator; and
- generating a halftone print code as a function of the dot size factor and the dot placement indicator.

The Examiner mentions nothing of these bulleted limitations and, thus, fails to establish a prima facie case of anticipation.

Furthermore, with respect to Claim 1, the Applicant explained that the '025 patent failed to teach or suggest controlling dot cluster size according to pixel intensity. For the same reasons, the '025 patent also fails to teach or suggest "obtaining a cluster factor corresponding to the pixel's intensity." In fact, the '025 patent mentions nothing of cluster factor, let alone obtaining a cluster factor corresponding to anything.

For at least these reasons, Claim 11 is patentable over the cited reference.

Claim 12 is directed to a computer readable medium having computer executable instructions for causing a print engine to generate a halftone, the medium including instructions for implementing the method of Claim 1. For at least the same reasons Claim 1 is patentable, so is Claim 12 and Claims 13-21 which depend from Claim 12.

Claim 22 is directed to a computer readable medium having computer executable instructions implementing the method of Claim 11. For at least the same reasons Claim 11 is patentable, so is Claim 22.

Claim 23 is directed to a system having components capable of implementing the method of Claim 1. For at least the same reasons Claim 1 is patentable, so are Claim 23 and Claims 24-32 which depend from Claim 23.

Claim 23 is directed to a system having various means for implementing the method of Claim 1. For at least the same reasons Claim 1 is patentable, so is Claim 36.

ALLOWABLE SUBJECT MATTER

Claims 33 and 35 have been allowed. Claim 34 has been amended to depend from Claim 33 and should be allowed as well.

Claims 4-6, 15-17, 26-28, & 34 are objected to as being dependent upon a rejected base claim. The Examiner indicated that these claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. As the base Claims are patentable over the cited reference, the Applicant asks that the objection be withdrawn.

The Examiner indicated that Claims 7-10, 18-21, & 29-32 would be allowable if rewritten to overcome the §112 rejection and to include all of the limitations of the base claim and any intervening claims. The relevant claims have been amended to overcome the 12 rejection. As the base Claims are patentable over the cited reference, Claims 7-10, 18-21, & 29-32 are allowable in there dependent forms.

Conclusion

In view of the foregoing remarks, Applicant respectfully submits that Claims 1-36 define allowable subject matter. The Examiner is requested to indicate the allowability of all claims in the application and to pass the application to issue.

Respectfully submitted,
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July 9, 2008